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'Mini reimplantation' for the management of primary obstructed megaureter

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Summary

Introduction
The management of primary obstructed megaureter (POM) ranges from temporary double-J stenting to conventional ureteric reimplantation with tapering. Of late, several authors have favored refluxing reimplantation. In the present study the outcomes of 'mini reimplantation', where no tapering or advancement of the ureter was performed, have been analyzed.

Methods
Records of all children ($n = 28$) who underwent reimplantation for POM from 2004 to 2014 were retrospectively analyzed. During the initial 5 years, a Cohen's reimplantation with excisional tapering was performed (Group 1, $n = 15$). Due to complications, the technique was modified in the second 5 years (Group 2, $n = 13$). In this group, after opening the bladder, the distal narrow segment and grossly dilated POM (around 3–5 cm) were excised (Figure). After closing the detrusor behind the ureter, the ureter was reimplanted again at the original position without tapering or advancement. Bladder mucosa was closed cranial to the new ureteric orifice, providing a ureter:tunnel ratio of 1:2 (mini reimplantation). All patients underwent repeat ultrasonogram and MAG3 renogram, with indirect at 6 months and 1 year after stent removal to exclude obstruction/vesicoureteral reflux (VUR).

Results
In Group 1, a significantly higher proportion ($P = 0.04$) of patients (5/15) had to undergo repeat procedures for complications, compared with none in Group 2. In Group 1, there were two redo reimplants for recurrent obstructions; two nephrectomies for non-functioning kidneys; and one ureterostomy for pyonephrosis. Postoperative Grade 2–3 VUR was encountered in 3/15 patients in Group 1, and 2/13 patients in Group 2. These patients could be managed with antibiotic prophylaxis and no intervention was required.

Discussion
Conventional management of POM involved initial cutaneous ureterostomy, followed by reimplantation with tapering of the ureter. Megaureter reimplantation with and without tapering has been reported to have no significant difference in outcomes between them. To avoid a potentially difficult operation in a small infant bladder, a refluxing reimplantation has been proposed; however, there is a high re-operation rate following this technique.

The author feels that the reported technique is superior to the refluxing reimplantation, as there is no need for re-operation. The limitations of this study were the small numbers and short follow-up. However, the proposed 'mini reimplantation' with no tapering or advancement had good success rates in this small series. Further larger studies are required to support or negate the usefulness of this technique.

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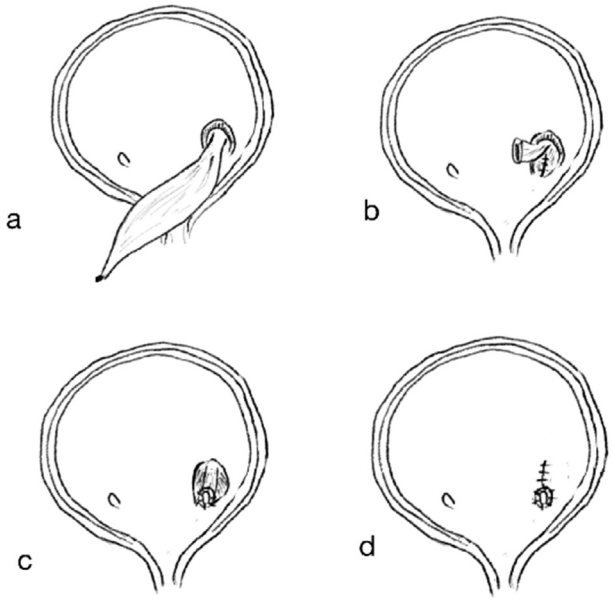

Figure (a) Distal POM excised; (b) detrusor closed behind; (c) the ureter reimplanted; (d) mucosa closed over.

Introduction

Primary obstructed megaureter (POM) is diagnosed in the presence of hydroureteronephrosis on ultrasonogram, stasis with decreasing differential renal function (DRF) on nuclear renogram, and absence of VUR on VCUG. The management options include: temporary double-J stenting [1]; endoscopic dilatation/ureterotomy; cutaneous ureterostomy and excision of distal adynamic segment followed by tapering of the ureter and reimplantation [2]. Classical reimplantation can be extremely difficult in a small infant bladder, and of late, several authors have favored refluxing reimplantation [2—4]. In the present study, the outcomes of classical tapered Cohen's reimplantation were compared with 'mini reimplantation', where no tapering or advancement of the ureter was performed.

Methods

Records of all children ($n = 28$) who underwent reimplantation for primary obstructed megaureter (POM) between 2004 and 2014 were retrospectively analyzed. Primary obstructed megaureter was diagnosed after confirming absence of VUR or PUV on VCUG, and the presence of hydroureteronephrosis with megaureter (diameter >10 mm) on ultrasonogram, and stasis on nuclear renogram. All patients were conservatively managed up to the age of 10 months with antibiotic prophylaxis, and rotation of antimicrobial agent in those with recurrent UTI. Indications for surgery included >10% drop in DRF and breakthrough infections. Those who underwent ureterostomy or initial stenting due to intractable urosepsis were excluded.

During the initial 5 years, a classical Cohen's reimplantation with excisional tapering was performed (Group 1, $n = 15$). Due to complications in these patients, the technique was modified in the second 5 years (Group 2, $n = 13$). In this group, after opening the bladder, the POM was dissected out, and the distal narrow segment and grossly dilated distal segment (around 3—5 cm) were excised (Fig. 1). A backing was provided to the ureter by closing the detrusor behind the ureter. No attempt at tapering was performed; the ureter was reimplanted again at the original position without crossing or advancement using 6-0 poly glycolic acid interrupted sutures; bladder mucosa was closed cranial to the new ureteric orifice, providing a ureter:tunnel ratio of 1:2. A double-J stent was kept in all cases and removed after 6 weeks. This procedure was called the 'mini reimplantation', as the tunnel length was minimal.

All patients underwent repeat ultrasonogram and MAG3 renogram with indirect cystogram at 3 months, 6 months and 1 year after stent removal to exclude obstruction/VUR. The final outcomes were compared between the groups, and the results were expressed as mean or percentage. After confirming normal distribution of data, statistical analysis was performed by Student's *t*-test and Fishers exact test.

Results

Table 1 shows the characteristics and outcomes between the groups. Male/left side preponderance was noted in both of the groups, with no significant difference between mode of presentation or age at surgery. None of the patients in this group had bilateral POM. There was no significant difference between the mean initial/final DRF between the groups.

In Group 1, a significantly higher proportion ($P = 0.04$) of patients (5/15) underwent repeat procedures for complications, compared with none in Group 2. In Group 1, two patients underwent redo reimplantation for recurrent pyelonephritis with obstruction; two patients underwent nephrectomy for persistent obstruction with severe impairment of function (DRF 7% in one, 8% in the other); one patient underwent ureterostomy for pyonephrosis.